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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,127	05/23/2007	Travis Wade	28944/50048	4575
57726 7590 04/24/2009 MILLER, MATTHIAS & HULL ONE NORTH FRANKLIN STREET SUITE 2350 CHICAGO, IL 60606				
EXAMINER				
CARLEY, JEFFREY T.				
ART UNIT		PAPER NUMBER		
4128				
MAIL DATE		DELIVERY MODE		
04/24/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/599,127

**Applicant(s)**

WADE ET AL.

**Examiner**

JEFFREY CARLEY

**Art Unit**

4128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/DE)  
Paper No(s)/Mail Date 02/19/08, 11/01/06, 06/11/07
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Claim Objections*

**Claims 1-29** are objected to because of the following informalities: the claims do not end in periods (".") at the conclusion of each claim. Each claim must begin with a capital letter and end with a period. See *Fressola v. Manbeck*, 36 USPQ2nd 1211 (D.D.C. 1995). Appropriate correction is suggested.

**Claim 1** is objected to because of the following informalities: On line 2 of the claim, the applicant typed "a first anodizing operating" it is the belief of the examiner that the applicant intended to claim "a first anodizing operation". For the purpose of examination, the examiner has hereinafter addressed the claim as such. Appropriate correction is suggested.

**Claim 1** is objected to because of the following informalities: The applicant wrote: "...along a first direction, comprising a second anodizing operation carried out in order to form at least one second pore that extends in the support material along a second direction, different from the first direction." It is the belief of the examiner that the applicant intended to claim "...along a first direction; further comprising a second anodizing operation carried out in order to form at least one second pore that extends in the support material along a second direction, different from the first direction." For the purpose of examination, the examiner has hereinafter addressed the claim as such. Appropriate correction is suggested.

**Claim 10** is objected to because of the following informalities: Applicant typed, "...support material is in the form of a position of a wire..." It is the interpretation of

the examiner that the applicant intended to type "portion" instead of "position". For the purpose of examination, the examiner has hereinafter addressed the claim as such.

Appropriate correction is suggested.

**Claim 18** is objected to because of the following informalities: The applicant claimed "...**at least three treatment steps in liquid medium**..." without any language to indicate that a process occurs. It is the interpretation of the examiner that the applicant intended to claim "...at least three treatment steps take place in a liquid medium," or something of the like. Hereinafter the examiner has interpreted the claim language according to the aforementioned interpretation. Appropriate correction is suggested.

**Claim 19** is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. In the instant case, claim 19 reads on an apparatus created by the process of the independent claim, claim 1, and is thus held to be improperly dependent therefrom.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-9, 13-25, and 29** are rejected under 35 U.S.C. 102(b) as being anticipated by Li et al. (US Pat 6325909 B1), hereinafter, Li.

Regarding **claims 1 and 2**, Li teaches **A process in which a first anodizing operating is carried out on a support material (12) in order to form at least one first pore that extends, in this support material, along a first direction** (col. 5, lines 34-40), **comprising a second anodizing operation carried out in order to form at least one second pore (16) that extends in the support material along a second direction, different from the first direction** (col. 5, lines 44-48; col. 7, lines 45-51; figs. 4a-5b); **the process wherein an insulating material is formed in the first pore** is inherent to the nature of anodizing aluminum to create anodized aluminum oxide, which is known to be an insulator.

Regarding **claim 3**, Li teaches **the process wherein an active material is formed in the second pore** (col. 5, lines 12-16).

Regarding **claim 4**, Li teaches **the process wherein the active material is chosen from a conductor, a semiconductor, a superconductor, a magnetic material and a carbon structure** (col. 5, lines 12-16).

Regarding **claim 5**, Li teaches **the process wherein the active material is deposited in the second pore by electrodeposition** (col. 6, lines 23-27).

Regarding **claim 6**, Li teaches **the process wherein the active material is a semiconductor material transparent to light** (col. 5, lines 12-16). Transparency to light is inherent to the nature of carbon nanotube structures, which are known to be active materials.

Regarding **claim 7**, Li teaches **the process wherein the semiconductor material is an organic material** (col. 5, lines 12-16).

Regarding **claim 8**, the process as claimed in claim 1, wherein the support material constitutes both a self-supporting structure for a components and electrical contact means (col. 5, lines 12-16 and lines 34-37).

Regarding **claim 9**, the process as claimed in claim 1, wherein a transistor is produced, the source (C) and drain (E) contacts of which are each at one of the ends of the second pore, respectively, and a gate (B) contact is produced by depositing a conducting material on the surface layer (col. 3, lines 52-63; fig. 5b).

Regarding **claim 13**, Li teaches **the process wherein at least one active element is enveloped in a matrix comprising the support material** (figs. 1a-1c and 2a-2b).

Regarding **claim 14**, Li teaches **the process wherein an electrically conducting material is deposited in at least one of the first and second pores** (col. 3, lines 48-51; col. 5, lines 12-16).

Regarding **claim 15**, Li teaches **the process wherein a thermally conducting material is deposited in at least one of the first and second pores** (col. 5, lines 12-16). High thermal conductivity is inherent to the nature of carbon nanotube structures, which are known to be active materials.

Regarding **claim 16**, Li teaches **the process wherein an optically conducting material is deposited in at least one of the first and second pores** (col. 5, lines 12-

16). Optical conductivity is inherent to the nature of carbon nanotube structures, which are known to be active materials.

Regarding **claim 17**, Li teaches **the process wherein at least one line of a material chosen from an electrically conducting material, a thermally conducting material and an optically conducting material is produced on the surface of the support material, in order to connect the active element to an external element** (col. 3, lines 48-51).

Regarding **claim 18**, the process as claimed in claim 1, wherein, at least **three treatment steps in liquid medium, including the first anodizing operation, the second anodizing operation and an electro-deposition step** (col. 5, lines 41-48; col. 6, lines 23-32).

Regarding **claim 19**, Li teaches **an element of support material with at least one first pore that extends along a first direction and at least one second pore that extends along a second direction, different from the first direction** (col. 5, lines 34-48; col. 7, lines 45-51; figs. 4a-5b).

Regarding **claim 20**, Li teaches **the component wherein the second pore is at least partly filled with an active material** (col. 5, lines 12-16).

Regarding **claim 21**, Li teaches **the component wherein the active material is chosen from a conductor, a semiconductor, a superconductor, a magnetic material and a carbon structure** (col. 5, lines 12-16).

Regarding **claim 22**, Li teaches **the component wherein the active material is transparent to light** (col. 5, lines 12-16). Transparency to light is inherent to the nature of carbon nanotube structures, which are known to be active materials.

Regarding **claim 23**, Li Teaches **the component wherein the active material is an organic material** (col. 5, lines 12-16).

Regarding **claim 24**, Li Teaches **the component wherein a first electrical contact is produced between the active material and the support material, on the bottom of the second pore** (col. 3, lines 57-64).

Regarding **claim 25**, Li Teaches **the component wherein the support material constitutes both a self-supporting structure for the component and electrical contact means** (col. 5, lines 12-16 and lines 34-37).

Regarding **claim 29**, the component as claimed in **claim 19**, further including **at least one active element connected via the first and second pores to the surface of the support material** (col. 4, lines 56-66).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 10-12, and 26-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Li and further in view of Leiber et al. (PG Pub. US 2002/0130311), hereinafter Leiber.



Regarding **claims 10 and 26**, Li teaches all of the elements as applied to claim 1 above. Li does not teach **the process wherein the support material is in the form of a position of a wire extending longitudinally parallel to the second direction**.

Leiber teaches that it is well known to utilize a **support material in the form of a portion of a wire extending longitudinally parallel to the second direction** (par. 0173).

It would be obvious to use the wire of Leiber to produce an electronic device such as a transistor by means of the process of Li. Leiber gives positive recitation of motivation for combination, "In an embodiment a field effect transistor (FET) is produced using a doped semiconductor having a smallest width of less than 500 nanometers or other width described above. The doped semiconductor can be either a p-type or n-type semiconductor, as is known by those of ordinary skill in the art in FET fabrication." (par. 0185).

Regarding **claim 11**, the modified invention Li teaches all of the elements of the current invention as described above, except **the process wherein a plurality of pores, including the first pore, are formed, each extending substantially over the thickness of a surface layer of the wire, radically perpendicular to the second direction**.

Leiber teaches that **a plurality of pores, including the first pore, are formed, each extending substantially over the thickness of a surface layer of the wire, radically perpendicular to the second direction** (fig. 6).

It would be obvious to modify the modified invention of Li by incorporation of the pores which extend over the thickness of a surface layer and are perpendicular to the second direction. "In an embodiment a field effect transistor (FET) is produced using a doped semiconductor having a smallest width of less than 500 nanometers or other width described above. The doped semiconductor can be either a p-type or n-type semiconductor, as is known by those of ordinary skill in the art in FET fabrication." (par. 0185). Further, as Leiber shows the utility of such a configuration, but does not demonstrate the method for formation, it is obvious that the procedure must have already occurred and is inherent to the structural limitations.

Regarding **claim 12** the modified invention of Li, as described above teaches **(Currently amended) the process wherein the surface layer of the wire constitutes a layer of dielectric.** Creating a dielectric layer is inherent to the nature of anodizing aluminum to create anodized aluminum oxide, which is known to be an electrical insulator.

Regarding **claim 27** the modified invention of Li, as described above teaches, **the component wherein the wire portion includes, at the second pore, a surface layer consisting of an electrically insulating material.** Creating a dielectric layer is inherent to the nature of anodizing aluminum to create anodized aluminum oxide, which is known to be an electrical insulator.

Regarding **claim 28** the modified invention of Li, as described above teaches, **the component wherein a second electrical contact, radically external with respect to the surface layer, is produced on this surface layer** (col. 3, lines 57-64).

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cheong et al. (PG Pub. US 2004/0149979 A1).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY CARLEY whose telephone number is (571)270-5609. The examiner can normally be reached on Monday through Thursday 8:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoa Huynh can be reached on (571)272-4888. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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